

gazelles, is the one to which alone the term antelopes should be applied if it were employed in a restricted and definable sense.

In their classification, the authors follow in the main the divisions sketched out by Sir Victor, although they have somewhat increased the number of sections, or sub-families, into which this assemblage of ruminants is split up. Into the limits of such sections it is quite unnecessary to enter upon the present occasion, as it is into any details with regard to species. In the main the characters of most of the species have been drawn from the magnificent series of skins in the British Museum; and where this is the case no emendation on the diagnosis given by the authors is ever likely to be required. In a few instances, however, the Museum was possessed of only very inadequate material at the date when the descriptions were written, so that in these cases there is room for revision. An instance in point is afforded by the white-eared kob of the swamps of the Upper Nile, complete specimens of which have recently been presented to the Museum. By means of these it has been ascertained for the first time that the old bucks of this handsome species are deep black, at least during the pairing season.

Nomenclature, again, is a subject on which some change of opinion has taken place among naturalists during the period in which this work has been in progress. And it is probable that one at least of its authors would not now be prepared to defend the use of all the technical names therein employed.

Although the authors have to deplore the vast decrease that has taken place in the numbers of so many species of African antelopes, in only one instance (that of the blaauwbok) have they to lament complete extermination, and that is not chargeable to the present, or even to the last two or three generations. They record, however, that several species in South Africa are only kept in existence by special protection; and in this connection it may be observed that the effect of the present troubles in that region on these dying species must be watched with the utmost anxiety by all naturalists.

As regards the manner in which the descriptions of the various genera and species are drawn up, the reputation of the authors is a sufficient guarantee that this is, in the main, beyond criticism. And no effort appears to have been spared in order to acquire as much information as possible with regard to geographical distribution. As neither of the authors (except, perhaps, the junior in his youthful days) is acquainted with the animals described in their native wilds, recourse has been necessitated to the writings of others; and the authors may be congratulated that in most instances they have had the courage to give these borrowed accounts in their original guise, instead of endeavouring to conceal their source by paraphrasing.

In one respect, and in one respect only, is there cause for regret in connection with this undertaking, namely, that the authors have not seen fit to refer, or at least in any detail, to the comparatively little that is known in relation to the past history of the group of which they so ably treat. The description and definition of species (even if they be the chief points of interest to sportsmen) are most important, but they are, and can be, only com-

paratively insignificant features in the philosophical study of animal life and its meaning. One of the burning questions of the day (in zoological circles) is the origin of the Ethiopian fauna; whether it is endemic in the land from which it takes its name, or whether it is due to an immigration from more northern climes. As remains of species closely allied to the giraffes and antelopes of modern Africa are met with in the later Tertiary deposits of India, Persia and Greece, it is obvious that the groups mentioned have much connection with the solution of this important problem. It is, therefore, greatly to be regretted that the authors have not seen fit to give their own views on this point, so far as the evidence to be derived from antelopes is concerned, or, at all events, that they have not informed their readers that several of the genera of these animals, now restricted to Ethiopian Africa, formerly enjoyed a much more extensive geographical range.

In the prospectus to the work it is stated that the authors "are desirous of making the book interesting and instructive to the naturalist, sportsman and general reader." While maintaining throughout a high standard of scientific excellence, and refraining from lowering their style by the inclusion of so-called purely "sporting" accounts, which are only too frequently most wearisome and distasteful to the cultured reader, the authors may be congratulated on having succeeded in their intentions in a manner deserving of the heartiest commendation on the part of all to whom this splendid and monumental work appeals.

R. L.

THE SCIENCE OF ORE DEPOSITS.

Lehre von den Erzlagernstätten. By Dr. Richard Beck. ii Theil. Pp. ix-xviii + 385-724. (Berlin: Borntraeger, 1901). Mk. 8.50.

WE are thankful to find that Dr. Beck has not kept us waiting an unduly long time for the concluding portion of his valuable work, the first instalment of which was recently reviewed in these pages (see p. 245 January 10). The first part brought the description of the different classes of mineral deposits nearly up to the end of Fissure Veins; this subject is now brought to a conclusion with a number of general observations on this important group of ore deposits, the only criticism upon which need be that their limitations are somewhat too narrowly drawn. Most of the phenomena here described, such as the formation of gossans, enrichment or impoverishment of ores in depth, effects upon the surrounding "country," &c., are by no means confined to fissure veins, but are common to all classes of mineral deposits, depending as they do essentially upon the chemical composition of the mineral contents of the deposit, and either not at all or only in very remote degree upon its genetic relations or morphological features. The alterations and oscillations of mineral constitution that many veins show in depth are well but briefly described, although, perhaps, their close connection in many cases with changes in the country rock is hardly enough insisted on. It is almost certain that the well-known change in depth in the silver and copper contents of the Montana copper deposits is purely a

secondary phenomenon, and Dr. Beck is most probably in error when he ranks this among the primary modifications of ore deposits. The description of secondary alterations of deposits and the formation of gossans is extremely good, the chemical investigation of the subject being especially convincing. It must be noted that Dr. Beck only refers under this head to secondary changes above the permanent water-level (in the region of Pošepny's vadose circulation) and not to the phenomena which have recently attracted so much attention in America, and which, under the head of Secondary Enrichment of Ore Deposits, have been so ably investigated by Emmons, Weed and others; these Dr. Beck appears to omit entirely.

The section on the alteration of the wall rocks of mineral veins either by the influence of these veins themselves or by the agencies that have played an important part in the deposition of the mineral constituents of these veins, is a valuable summary of a very important subject, which has only in comparatively recent years attracted the attention that it deserves.

Coming next to the classification of other mineral deposits, or as Dr. Beck rather awkwardly designates them, "Not vein-like epigenetic ore deposits within stratified rocks," the subdivision is far from satisfactory. They are divided, first of all, as follows:—

- A. Epigenetic ore beds.
- B. Epigenetic ore masses.
- C. Contact-metamorphic ore deposits.
- D. Ore-bearing fillings of cavities.

Unfortunately, the first group contains many deposits that are generally looked upon as typical masses, *e.g.* the lenticular masses of cupriferous pyrites of the Huelva region. The group is subdivided into deposits occurring in crystalline strata and deposits in non-crystalline strata formed by impregnation, each class being then again subdivided according to its mineral contents. This classification is unfortunate, as it causes the author to describe the above-mentioned pyrites deposits as produced by impregnation; it would hardly be possible to assign a less probable genesis to such deposits as these, consisting as they do mainly of dense massive pyrites practically free from gangue, and it seems impossible to imagine that any one who has ever studied these deposits can seriously believe that they owed their origin to impregnation. It is in any case most unlikely that a system of classification that forces these deposits and the Norwegian and other similar pyrites deposits into different groups, and that takes, moreover, no account of the eruptive rocks with which they are so closely associated, can possibly be correct.

The group of Epigenetic ore masses is a rather more coherent one than its title implies, Dr. Beck confining this group to irregular deposits in calcareous rocks. It is perhaps doubtful whether this is the right place for those very puzzling deposits that are generally spoken of as the gold-bearing "reefs" of Pilgrim's Rest, Lydenburg; it is perhaps more likely that these will prove ultimately to be true bedded deposits, though their real character is to-day far from clear.

The next division of the book contains a short but good description of alluvial deposits; the objections to the independent treatment of this group of deposits

have already been pointed out. Apart from these, Dr. Beck's descriptions are thoroughly satisfactory.

The work concludes with a brief but good chapter of general hints upon the search for mineral deposits. In this the author attempts, and with considerable success, to show that the scientific study of mineral deposits can give information of the greatest value to prospectors, and that his subject accordingly possesses, not merely a scientific and academic, but also a technical and commercial interest that should not be overlooked. This last chapter may more especially be recommended to the large number of mining engineers in this country who appear to think that the study of mineral deposits is one that they can venture to neglect as of no practical importance.

It is satisfactory to find that the wish expressed in the review of the first part of this book has been gratified, and that it is furnished with a good topographical as well as a general index, and it is a pleasure to be able to congratulate Dr. Beck on the production of a work of standard value upon the fascinating subject that he has done so much to advance.

HENRY LOUIS.

ORGANIC CHEMISTRY.

Practical Organic Chemistry for Advanced Students.

By Dr. Julius B. Cohen. Pp. xi + 284. (London: Macmillan and Co., Ltd., 1900.) Price 2s. 6d.

IN this enlarged edition Dr. Julius Cohen has increased greatly the value of the book as a manual for advanced students by adding chapters on organic analysis and the determination of the molecular weight. Under the latter heading we are glad to see he describes the preparation of the silver salts of organic acids and of the platinum salts of bases—two operations the description of which is frequently omitted from similar works. The appendix, which treats of the theory in the form of a note on each preparation, has also been enlarged. Our experience has been that students will not trouble to hunt theory in the limbo of an appendix, and the matter of these notes would have been more usefully incorporated in the preparations themselves. The explanations are necessarily condensed and frequently difficult to understand; for example (p. 193), "Aldehydes can only be obtained directly from the fatty acids by distilling the calcium salt with calcium formate; *but in no case by direct reduction, unless in the form of lactones.*"

The preparations are well and clearly described, and the apparently obvious is not ignored. Thus we read (p. 43), "A small balance with celluloid pans, for use on the bench, is indispensable." Such a balance is invariably used by German students in order to estimate their yields, but is a sufficiently rare object in an English laboratory.

Details of the preparation of ninety-seven substances are given, and consequently the book will be of great service, not only to the student, but also to the lecturer. Of the fifty-six substances usually prepared by the honour students at the Owens College, fifty-two are to be found in this book.

In a useful series of "Hints on the investigation of